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LEFT VENTRICULAR SYSTOLIC AND DIASTOLIC INTERDEPENDENCE DEMONSTRATED BY LEFT VENTRICULAR EMPTYING AND FILLING RATES BY GATED SPECT MPI

ACC Poster Contributions
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Background: Systolic and diastolic function are considered as independent processes in older patients with heart failure (CHF) symptoms with preserved left ventricular function. Previously, systolic function has been assessed by ejection fraction (EF) and diastolic function by echo Doppler. However, systolic emptying and diastolic filling rates derived from volume-time curves may provide additional information about myocardial performance.

Methods: We measured peak systolic emptying rates and peak early and late diastolic filling rates from routine SPECT MPI post-stress gated images on all patients presenting for a clinically indicated stress test over a 4 month period. Only patients with normal EF (≥50%), normal myocardial perfusion (summed stress score < 3), and two discernable diastolic filling peaks were included in the analysis. Patients were divided into 2 groups:≥ 60 yrs or < 60 yrs old.

Results: Out of 703 total patients, 329 met inclusion criteria. Mean age was 65.3 ± 4.1 yrs and 59.6% female. Compared to younger patients, older patients had slower systolic emptying and early diastolic filling, and more rapid late diastolic filling (p<0.0001)(Figure). In the entire cohort, systolic emptying rate decreased as early diastolic filling rate decreased (r2=0.646).

Conclusion: For the first time, SPECT MPI gating demonstrated subtle but potentially important age-related abnormalities in systolic and diastolic performance which may explain the CHF symptoms in older patients with normal EF.